brought about by the disconcerting similarity in the shape, size and colour of most of the commercially prepared pills that an individual patient has to take or are distributed within one hospital ward. All these round white or round yellow tablets are difficult to sort out.

It is not logical that digitalis, a diuretic and an anticoagulant should all have the same appearance. I will not go as far as to suggest that the first should be heart-shaped, the second kidney-shaped and the third erythrocyte-shaped, but the smallest mix-up between these three pharmacologic categories could be ill-fated.

There are two solutions to the chromoconfusion problem. The first consists of making it mandatory for the pharmacist to indicate on the label the generic name of any prescription drug he dispenses. The old-fashioned practice of not doing so, which may be intended to confer mystery and magic on drugs, can no longer easily be justified. Mandatory labelling falls under the jurisdiction of the health protection branch of Health and Welfare Canada. The second solution lies in the hands of industry; it consists of preparing formulations that are distinctive because of their shape, size or colour.

Tablets with distinctive characteristics are safer for the patient, especially if he or she is elderly or confused. When two commercial preparations of the same ingredient are available, the physician should choose the one with the most original appearance. For a presbyopic person with heart failure, nothing is easier than confusing Lasix, 40 mg with Valium, 5 mg (check this out for yourself in the product recognition section of the "Compendium of Pharmaceuticals and Specialties"). If the patient is taking digitalis and one fine Monday takes four of the Lasix tablets instead of the Valium, no one could answer for his abnormal electrocardiogram or his kalemia on Tuesday.

One last point to consider: substitution. If a physician prescribes the diuretic Uritol (oval and pink) to avoid confusion with the round yellow Valium tablets, the pharmacist should not substitute a brand of furosemide that has round yellow tablets because this can lead to chromoconfusion for the patient as well as the physician. Let us imagine that a nephrologist has prescribed Uritol and Valium, 5 mg to a patient with the nephrotic syndrome and insomnia. On one occasion the prescription is renewed by a pharmacist, who substitutes Lasix for Uritol. Subsequently, the nephrologist finds the patient to be more nervous and hypokalemic and tells him to take less diuretic and more diazepam. The patient returns home and takes one Valium tablet in the morning and three Lasix tablets each day.

In conclusion, it would be well worth while to bring pressure to bear on the health protection branch to make it mandatory that generic names appear on all drug container labels. Meanwhile, the pharmaceutical industry should try to avoid too great a similarity in their preparations when they are intended for the same category of patients and when confusion could have unfavourable pharmacologic effects.

P. BIRON, MD
Professor of pharmacology
University of Montreal
Montreal, PQ

References

1. BIRON P: A hopefully biased pilot survey of physicians' knowledge of the content of drug combinations. *Can Med Assoc J* 109: 35, 1973
2. GAGNE J: A survey of hospital pharmacists' knowledge of the content of drug combinations (C). *Ann Intern Med* 82: 680, 1975
3. BIRON P, CARIGNAN R: Chromoconfusion: a new type of pill-pill "interaction" in cardiology. *Can Med Assoc J* 110: 1346, 1974

Evidence and belief

To the editor: Just as one man's meat is another man's poison, one physician's evidence can be another physician's fortuity. Scientific medicine links data (evidence) and theory. When a treatment can be bolstered by what appears at that moment to be a logical theory, confidence in the treatment is increased. The fact that a treatment is effective is not considered scientific evidence unless there is an explanation. That most explanations are eventually found to be incorrect or have to be modified does not diminish our dependence on observation bolstered by theory. This reasoning has been both beneficial and harmful. The beneficial aspects are known, but the deleterious aspects are not generally recognized.

There is no doubt that every successful treatment must have some logical explanation, but in most cases the explanation comes long after the original observations have been made. What is harmful is the demand by scientific medicine that there must be an immediate and widely acceptable explanation before the treatment is sanctioned. This is advanced as a reason for ignoring or resisting treatments for which there is no widely acceptable theory. If the explanation runs counter to the generally established ideas, opinion as to the worth of the therapy being advocated will remain prejudiced.

Recently I was astonished by the violent reaction of a physician whose patient reported that he had been cured by a 4-day fast. This patient had been referred by the physician because his severe migraine headaches had not been relieved after 35 years of treatment by a succession of physicians. Consequently he suffered from severe anxiety and tension with repeated episodes of severe depression. Treatment with tricyclic antidepressants worsened his symptoms. A brain scan and other neurologic investigations were planned.

The clinical history suggested that the patient was allergic to certain foods. Chocolate would invariably trigger his headaches and fresh bread caused severe gastrointestinal symptoms. Examination of his mental state revealed no abnormality.

He was advised to fast for 4 days and by the 4th day he was feeling well. Over the next month he found he had severe reactions to raspberries, pork, grapefruit and apple juice, but not to whole-wheat bread. These foods precipitated a severe but brief headache the morning after they had been ingested.

At this time the patient stated that in 35 years he had never felt so well. When he reported his recovery to his physician, he expected the physician to be pleased and interested. Instead the physician became hostile and angry and a violent argument ensued. The physician admitted that the patient might be feeling healthy, but insisted that he have an investigation to rule out a brain tumour, forgetting that, on the previous visit, he had reassured the patient that there was no evidence of cerebral disease.

Why was the physician so angry? Because the system of medicine by which he had been trained could not countenance any possibility that depriving a patient of food for 4 days could be beneficial, or that a patient could have been ill for 35 years because of the continual consumption of foods to which he was allergic. His theoretical frame of reference left no room for such an idea. When confronted with what appeared to be an impossible event the physician reacted with anger and hostility.

I attribute this type of unreasonable reaction to medical education. Dr. Walter Alvarez once told me that over 50 years ago he nearly lost his job at the Mayo Clinic because he had published a paper about food allergy. Everyone then "knew" no one could be allergic to food. He was saved when one of the Mayo brothers, following up this lead, discovered that he too had a food allergy that had caused him a lot of trouble. It is clear that medical hostility to ideas not taught in medical school has not diminished in the past half-century. If our profession is to regain its stature with the public we will have to learn to study effective treatments with less hostility and more interest, otherwise our work will be

taken from us by other health professionals.

A. HOFFER, MD, PH D
3A-2727 Quadra St.
Victoria, BC

Auxiliary medication instructions: one way of improving compliance

To the editor: Modern therapeutics have become more effective, complex and dangerous. Drugs must often be self-administered by patients whose understanding and memory are less than ideal. They may have been prescribed by a physician who was too hurried to instruct the patient in the details of when to take the medication in relation to meals and not to take it along with certain "over-the-counter" preparations such as antacids. The pharmacist may not take the time or believe he has the authority, let alone the responsibility, to give this professional advice to the patient. However, there is no substitute for individual and repeated personal counselling.

The misuse of prescription medications by ambulatory patients is both a serious and a controversial medical problem.[1-15] The need for positive action by the department of pharmaceutical services at the Toronto General Hospital became evident as a result of two studies performed by the outpatient pharmacy.[16,17] Briefly, these studies revealed that ambulatory patients were not using their prescription drugs (and to some extent their nonprescription drugs) safely and effectively, and that a combination of verbal and written instructions reduced the number of medication errors. Therefore a project was carried out to establish a series of auxiliary medication instruction sheets.[18]

The instruction sheets used at the Toronto General Hospital* contain the name of the drug (nonproprietary or generic, or the trade name for a combination product), special instructions on administration, significant potential side effects or adverse effects and how to cope with them, and special storage instructions when applicable (Fig. 1). The use of a separate sheet for each drug has certain advantages: each is tailor-made for the specific drug, changes in the information are made easily, errors in distribution are reduced (generic names appear on both the instruction sheet and the prescription label and the patient can associate a specific instruction sheet with a specific prescription), and distribution time is reduced since it is not necessary to consult a master list or to check off pertinent instructions. The medication instruction sheets are also used by the ward pharmacist counselling patients in the self-medication program and before discharge from the hospital.

Since the problem of patient compliance is complex and controversial, no single solution may be completely satisfactory. However, the positive approach we describe is one possibility.

We thank G.A. Tuttle, D.A. Smeltzer and F. Matuk for developing and expanding the auxiliary medication instructions, and the members of the pharmacy and therapeutics committee, Toronto General Hospital for reviewing and recommending approval of the medication instructions.

R.A. MERRETT, M SC PHM
W.T.W. CLARKE, MD, FRCP[C]
Departments of pharmaceutical services and medicine
Toronto General Hospital
Toronto, Ont.

*Copies may be obtained from Mr. W. Marigold, Manager, Department of pharmaceutical services, Toronto General Hospital, 101 College St., Toronto, Ont. M5G 1L7, for $2 (please make cheque payable to the Toronto General Hospital).

TORONTO GENERAL HOSPITAL
PHARMACY DEPT.

AMPICILLIN

Take this medication on an empty stomach 1 hour before meals or 2 hours after meals. However, do not omit a dose if the above is forgotten.

Continue taking this medication until it is all finished, even if you start feeling better.

If you develop a skin rash, or severe diarrhea, contact your physician.

If you are allergic to penicillin, be sure to notify your physician before taking this medication.

TORONTO GENERAL HOSPITAL
PHARMACY DEPT.

GUANETHIDINE

Hypertension (high blood pressure) rarely shows visible symptoms; therefore, do not discontinue the use of this medication without the advice of your physician.

While on this medication, be sure to get up slowly after lying down. Sit up with your legs dangling over the edge of the bed for 1 or 2 minutes before standing up, to avoid getting dizzy.

TORONTO GENERAL HOSPITAL
PHARMACY DEPT.

BISACODYL TABLETS

Do not take any milk or antacids within 1 hour of taking this medication.

Do not chew the tablet. Swallow it whole.

TORONTO GENERAL HOSPITAL
PHARMACY DEPT.

NITROGLYCERIN

These tablets may deteriorate with heat or moisture. Therefore, keep the bottle tightly closed in a cool place at home. Carry only a few tablets in an outside pocket or purse in a brown glass bottle.

Do not place cotton or other medications in the bottle with these tablets. If you have not used the tablets within 3 months, you should obtain a fresh supply. Do not swallow the tablet. Place under the tongue and hold there until it dissolves.

If relief from pain is not obtained, another tablet may be taken. This medication may cause mild gastrointestinal upset, flushing, headache, rapid heart rate or dizziness. If so, sit or lie down when taking nitroglycerin.

FIG. 1—Examples of auxiliary medication instructions used at the Toronto General Hospital.

References

1. LATIOLAIS CJ, BERRY CC: Misuse of prescription medications by outpatients. *Drug Intell Clin Pharm* 3: 270, 1969
2. WATKINS JD, ROBERTS DE, WILLIAMS TF, et al: Observation of medication errors made by diabetic patients in the home. *Diabetes* 16: 882, 1967
3. SHARPE TR, MIKEAL RL: Patient compliance with antibiotic regimens. *Am J Hosp Pharm* 31: 479, 1974
4. COLCHER IS, BASS JM: Penicillin treatment of streptococcal pharyngitis. *JAMA* 222: 657, 1972
5. LINKEWICH JA, CATALANO RB, FLACK HL: The effect of packaging and instructions on outpatient compliance with medication regimens. *Drug Intell Clin Pharm* 8: 10, 1974
6. CLINITE JC, KABAT HF: Improving patient compliance. *J Am Pharm Assoc* 16: 63, 1976
7. PAULSON PT, BAUCH R, PAULSON ML: Medication data sheets — an aid to patient education. *Drug Intell Clin Pharm* 10: 448, 1976
8. DICKEY FF, MATTAR ME, CHUDZIK GM: Pharmacist counselling increases drug regimen compliance. *Hospitals* 49: 85, 1975
9. HULKA BS, CASSEL JC, KUPPER LL: Disparities between medications prescribed and consumed among chronic disease patients. Paper presented at Tulane University symposium, 1975
10. SMITH DL: Patient compliance with medication regimens. *Drug Intell Clin Pharm* 10: 386, 1976
11. MAZZULLO JM: Methods of improving drug compliance. *Drug Ther* 6: 148, 1976
12. HAYNES RB, SACKETT DL, GIBSON ES, et al: Improvement of medication compliance in uncontrollable hypertension. *Lancet* 1: 1265, 1976
13. SACKETT DL, HAYNES RB, GIBSON ES, et al: Randomised clinical trial of strategies for improving medication compliance in primary hypertension. *Lancet* 1: 1205, 1975
14. MCKENNEY JM, SLINING JM, HENDERSON HR, et al: The effect of clinical pharmacy services on patients with essential hypertension. *Circulation* 48: 1104, 1973
15. BALL WL: Improving patient compliance with therapeutic regimens: Hamilton symposium examines the problems and solutions. *Can Med Assoc J* 111: 268, 1974
16. TUTTLE GA: *A Clinical Approach to Pharmacy Practice in the Outpatient Department*, pharmacy residency project, Toronto General Hospital, 1970
17. SMELTZER DA: *A Study into the Utilization of Medication Notes (Medi-Notes) in the Outpatient Department of Toronto General Hospital*, pharmacy residency project, Toronto General Hospital, 1973
18. MATUK F: *The Implementation of a Medi-Notes System and the Investigation of a Patient Profile System at the Outpatient Department of Toronto General Hospital*, pharmacy residency project, Toronto General Hospital, 1974